

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

- 1-16. (Cancelled)
17. (Currently amended) A method for cutting at least one packaged substrate, the method comprising:
- a) providing:
 - a water jet cutting tool for supplying a water jet;
 - a first movable mount for moving between a loading location and a cutting location; and
 - a second movable mount for moving between the cutting location and an unloading location;
 - b) moving the first movable mount from the loading location to the cutting location with the at least one packaged substrate disposed thereon;
 - c) while the at least one packaged substrate is disposed on the first movable mount, cutting the at least one packaged substrate in a first reference direction using the water jet supplied by the water jet cutting tool at the cutting location;
 - d) transferring the at least one packaged substrate from the first movable mount to the second movable mount at the cutting location;
 - e) while the at least one packaged substrate is disposed on the second movable mount, cutting the at least one packaged substrate in a second reference direction, the second reference direction being perpendicular to the first reference direction, using the water jet supplied by the water jet cutting tool at the cutting location to produce a plurality of packaged semiconductor devices; and
 - f) moving the second movable mount from the cutting location to the unloading location for transporting the plurality of packaged semiconductor devices to the unloading location.

18. (Previously presented) A method in accordance with claim 17 further comprising loading the at least one packaged substrate on the first movable mount.

19. (Previously presented) A method in accordance with claim 17 further comprising unloading the plurality of packaged semiconductor devices from the second movable mount.

20-21. (Cancelled)

22. (Previously presented) A method in accordance with claim 17 further comprising aligning the at least one packaged substrate on the first movable mount relative to the water jet cutting tool.

23. (Previously presented) A method in accordance with claim 17 further comprising aligning the at least one packaged substrate on the second movable mount relative to the water jet.

24. (Currently amended) A method in accordance with claim 17, further comprising:
determining a distance between the water jet cutting tool and the at least one packaged substrate; and
displacing the water jet cutting tool relative to the at least one packaged substrate for adjusting the distance therebetween.

25. (Previously presented) A method in accordance with claim 23 wherein (f) further comprises unloading the plurality of packaged semiconductor devices from the second movable mount at the unloading location.

26. (Previously presented) A method in accordance with claim 17 wherein (c) further comprises moving the first movable mount in the first reference direction for facilitating cutting of the at least one packaged substrate in the first reference direction.

27. (Previously presented) A method in accordance with claim 17 wherein (c) further comprises directing the water jet along the second reference direction for facilitating cutting of the at least one packaged substrate along multiple parallel lines in the first reference direction.

28. (Previously presented) A method in accordance with claim 17 wherein (e) further comprises rotating the packaged substrate on the second movable mount before moving the second movable mount in the first reference direction for facilitating cutting of the at least one packaged substrate.

29. (Previously presented) A method in accordance with claim 17 wherein (e) further comprises moving the water jet in the second reference direction for facilitating cutting of the at least one packaged substrate in the second reference direction.

30. (Previously presented) A method in accordance with claim 17, wherein (d) comprises:
picking the at least one packaged substrate off the first movable mount; and
moving the first movable mount from the cutting location to the loading location, moving the second movable mount from the unloading location to the cutting location, and placing the at least one packaged substrate picked off the first movable mount onto the second movable mount.

31. (Currently amended) An apparatus for cutting a packaged substrate comprising:
a set of transport guides having a length that extends in a first direction between a loading location, a cutting location, and an unloading location, the cutting location being disposed between the loading location and the unloading location;
a first movable mount coupled to the set of transport guides, the first movable mount comprising a first rotatable section;
a second movable mount coupled to the set of transport guides, the second movable mount comprising a second rotatable section;
a first gantry extending in a second direction and bridging at least a portion of the set of transport guides, the second direction being perpendicular to the first direction; and

a water jet cutting tool coupled to the first gantry and displaceable therealong in the second direction at the cutting location.

32. (Previously presented) The apparatus as in claim 31, wherein the first movable mount is displaceable along the set of transport guides between the loading location and the cutting location, the first movable mount receiving the packaged substrate at the loading location before being displaced along the set of transport guides for transferring the packaged substrate to the cutting location.

33. (Currently amended) The apparatus as in claim 32, wherein a plurality of cuts are made through the packaged substrate ~~is cut~~ in the first direction when the packaged substrate is disposed on the first movable mount.

34. (Previously presented) The apparatus as in claim 33, wherein the second movable mount is displaceable along the set of transport guides between the cutting location and the unloading location, the second movable mount receiving the packaged substrate from the first movable mount at the cutting location.

35. (Previously presented) The apparatus as in claim 34, wherein the second rotatable section rotates the packaged substrate disposed on the second movable mount for facilitating cutting thereof in the second direction.

36. (Currently amended) The apparatus as in claim 35, wherein the water jet cutting tool ~~comprises comprising~~ at least one water jet nozzle for supplying a water jet for cutting the packaged substrate in each of the first and second directions.

37. (Previously presented) The apparatus as in claim 36, wherein the water jet comprises at least one abrasive material.

38. (Previously presented) The apparatus as in claim 36, further comprising a distance detector mounted proximal the at least one water jet nozzle, the distance detector operable for determining a distance between the at least one water jet nozzle and the packaged substrate.

39. (Previously presented) The apparatus as in claim 36, further comprising an actuator coupled to the at least one water jet nozzle, the actuator being operable for displacing the at least one water jet nozzle to thereby adjust the distance between the at least one water jet nozzle and the packaged substrate.

40. (Currently amended) ~~The apparatus as in claim 31, further comprising~~ An apparatus for cutting a packaged substrate comprising:

a set of transport guides having a length that extends in a first direction between a loading location, a cutting location, and an unloading location, the cutting location being disposed between the loading location and the unloading location;

a first movable mount coupled to the set of transport guides, the first movable mount comprising a first rotatable section;

a first image capture device configured for capturing an image of the packaged substrate disposed on the first movable mount;

a second movable mount coupled to the set of transport guides, the second movable mount comprising a second rotatable section;

a first gantry extending in a second, the second direction being perpendicular to the first direction; and

a water jet cutting tool coupled to the first gantry and displaceable therealong in the second direction at the cutting location.

41. (Previously presented) The apparatus as in claim 40, further comprising a second image capture device for capturing an image of the packaged substrate disposed on the second movable mount.

42. (Previously presented) The apparatus as in claim 31, further comprising a pick and place assembly configured to transfer the packaged substrate from the first movable mount to the second movable mount.

43. (Currently amended) A method for singulating a packaged substrate comprising:
loading a packaged substrate onto a first movable mount at a loading location;
transferring the first movable mount to a cutting location;
cutting the packaged substrate in a first direction;
transferring the packaged substrate onto a second movable mount;
cutting the packaged substrate in a second direction; and
transferring the second movable mount to an unloading location,
wherein at least one of cutting the packaged substrate in the first direction and cutting the packaged substrate in the second direction is performed using a water jet while the packaged substrate is disposed on one of the first movable mount and the second movable mount.

44. (Previously presented) The method as in claim 43, wherein each of cutting the packaged substrate in the first direction and cutting the packaged substrate in the second direction is performed at the cutting location.

45. (Previously presented) The method as in claim 44, wherein the first direction and the second direction are orthogonal.

46. (Currently amended) The method as in claim 45, further comprising:
adjusting a distance between the water jet cutting tool and the packaged substrate at the cutting location; and
aligning the packaged substrate relative to the water jet cutting tool at the cutting location.

47. (Previously presented) The method as in claim 46 wherein transferring the first movable mount to the cutting location and transferring the second movable mount to the unloading location occur in a generally simultaneous synchronized manner.